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S. W. ZOLDOK

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KNOCK-DOWN TANK

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Fig. 1.

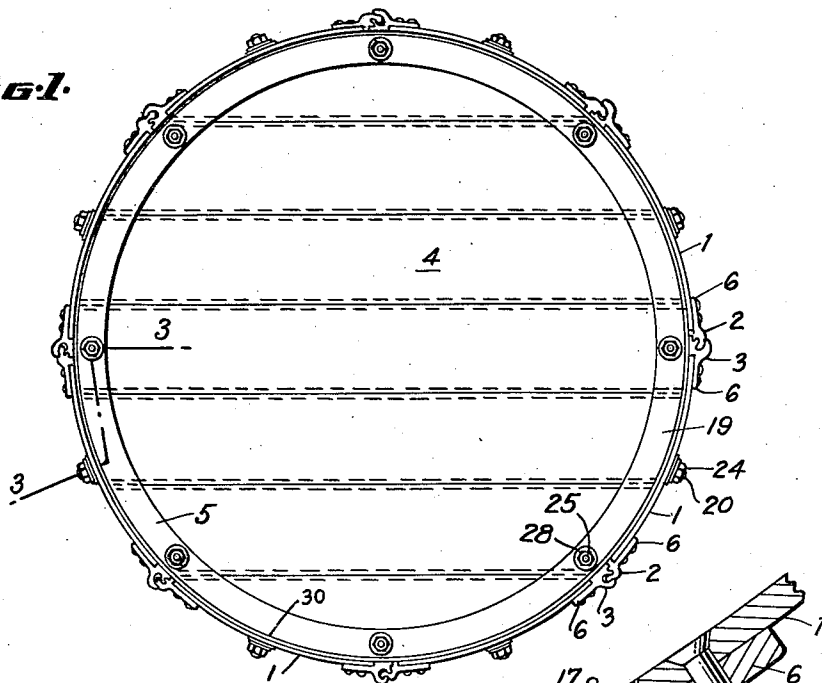


Fig. 2.

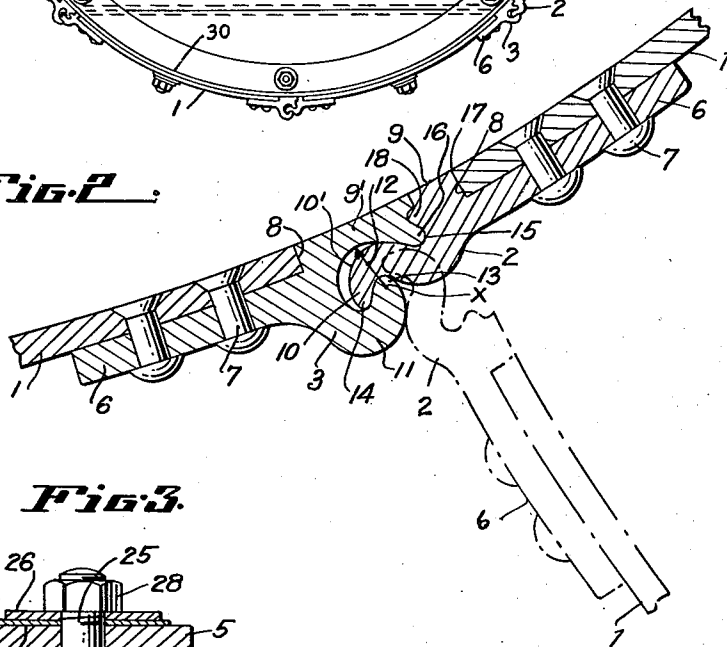
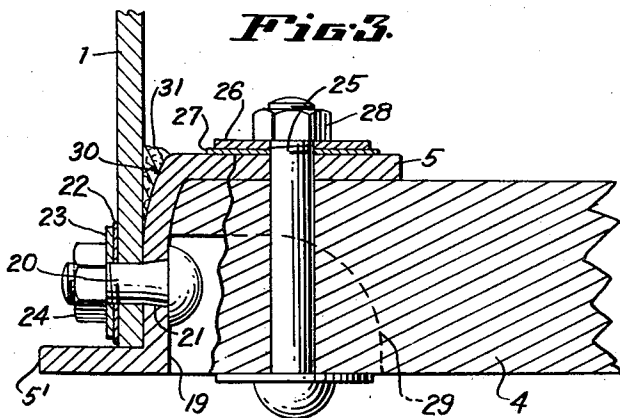


Fig. 3.



INVENTOR.
STEPHEN W. ZOLDOK
BY *J. A. Bried*
ATTORNEY.

UNITED STATES PATENT OFFICE

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KNOCKDOWN TANK

Stephen W. Zoldok, Oakland, Calif.

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1 Claim. (Cl. 220—5)

This invention relates to pre-fabricated or knock-down tanks, particularly large steel wall tanks as used in the cyanide gold extraction process and other tanks used in localities difficult of access and to which it is impossible to transport such tanks in made-up form, and which places are generally inadequately equipped to build such tanks from the flat plates.

The principal object of the invention is to provide improvements in knock-down tanks of the kind referred to, which may be more easily erected than any heretofore obtainable, insofar as I am aware.

Other objects are to provide such knock-down tank construction which will be simple and inexpensive, which will avoid to great extent the high lifting of the tank wall sections, will insure tight section joints, will provide for easy securing, or replacement of the tank bottom.

In the drawing accompanying the description—

Fig. 1 is a plan view of an assembled knock-down tank incorporating my improvements.

Fig. 2 is a greatly enlarged horizontal sectional view of one of the vertical or section joints of my improved tank taken on a line anywhere through the joint.

Fig. 3 is a greatly enlarged vertical cross section of the tank as seen from the line 3—3 of Fig. 1.

In further detail the tank comprises a steel shell with a wooden bottom, though insofar as the invention is concerned the bottom could also be of steel, and/or both shell and bottom may be made of any other desired metal. The shell is here shown made of 8 vertical sections 1 locked along vertical lines by a special interlocking joint 2, 3, and the bottom 4 is of wood supported on the upper flange 5 of a marginal steel Z bar formed into ring shape and bolted to the lower margins of the side walls 1 and with the bottom boards bolted to the flange 5.

The construction of the vertical lock joint is best shown in Fig. 2 and in which it will be seen to comprise two special steel shapes 2 and 3 which may be termed respectively tongue and socket members, each of which is a long strip of metal having one plain slightly curved marginal portion 6 permanently riveted to the outside of the pre-curved steel shell section 1 as by rivets 7 (or welded in place of riveting), and the opposite margins formed with square shoulders at 8 tightly abutting the extreme edges of the curved wall sections, and being thickened at these points as at 9—9' to come flush with the inside of the

tank shell, while outwardly of the thickened portions, members 2 and 3 are respectively formed with a tongue member 10 and a socket member 11.

The inner curve of the socket member is on a radius 12 thrown from the center X of a rounding nose 13 which is itself rounded from the same center, and nose 13 seats within a socket formed from the same center. Likewise the tongue member 10 is generally curved from the center X and is rounded at its extreme end 14 the same as nose 13 and similarly seated in a rounded socket formed in member 11, all to form a pair of reversely or complementarily formed hooks which though hooked together as shown in Fig. 2, may be separated either by sliding apart vertically or longitudinally of the joint, or they may be rocked out of engaged position by swinging member 2 outward with respect to member 3 on the axis X until the end 14 of member 2 clears nose 13 to permit lateral separation of the parts (as shown by the dotted position of member 2), the tongue member 10 being flattened at the side as at 10' to give the clearance required. By a reverse operation, of course, the joint may be re-engaged.

To insure tightness and alignment of the lock joint the tongue member 10 is made of somewhat S form to provide an additional socket at 15 into which a rounded rib or bead 16 seats (projecting from member 2), and between this and the straight abutting juncture 17 of thickened portions 9, 9' is a centering bead or tongue 18 which projects from member 2 and fits into a complementary groove in member 9', these members being under compression.

In putting the joint together, both members are first liberally painted with tar, white lead, graphite and oil, or other unctuous sealing compound, or any permanently hardening cement, all depending on whether it is desired to ever take the tank apart again.

In contemplating the lock joints, it is manifest that the last section of the tank wall could not be hooked in place as described as it could not be swung outwardly with respect to effect initial engagement. However, in plants where means is available for lifting the last section high enough, it may be slid into place from above, though where lifting the last section must be avoided, the last joint member 2 is left unriveted to its side wall section and is riveted thereto with rivets 7 after the last wall section is in place.

At the lower end of the tank the side wall section or plates rest directly upon the horizontally

outwardly extending or lower flange 5' of marginal Z bar 19 and are secured thereto as by riveting or welding if a permanent job, or by bolts 20 preferably having tight fitting tapered shanks 21, and lead, copper, or other gaskets 22 under washers 23 upon which the nuts 24 are seated.

The wooden bottom 4 is bolted upward against the upper flange 5 by bolts 25, preferably with washers 26 at both ends and sealing gasket washers 27. Instead of the bolt nuts 28 being inside of the tank as shown, the bolts may of course be reversed to bring the nuts below the bottom.

Bolts 20 and 25 are shown in Fig. 3 as being in the same plane, but in practice they will of course be staggered when viewed in plan, and notches will be cut out of the underside of the bottom 4 as indicated at 29 for each bolt 20 to permit of inserting the bolt. The holes for the bolts may all be drilled or punched to template before the tank is shipped, or drilled in place in the factory set up, or some may be drilled at the factory and others on the job, all depending on the size of the tank and facilities available.

Marginal Z member 19 may be a complete ring welded at the joint, for small and medium size tanks, but for very large tanks it may be in any desired number of sections, and in order to facilitate making a liquid tight juncture with the side walls of the tank this Z member is beveled off at an acute angle at 30 to provide a wedge-like space all around the inner corner of the tank to receive any desired filler or caulking compound 31.

It should also be noted that while I have shown a wooden bottom to the tank, and which may be of tongue and groove, or splined edged boards as indicated, if required for particular usage, the bottom may be of sheet metal if desired.

For very large tanks any desired body stiffening angles or braces may be used as is well understood in the art.

In considering the interlocking side joints on my tank construction, it will be seen that when the tank is completely erected the two outer hooking members 10 and 11 are in considerable tension, while the inner or adjacent tongue and groove members 16 and 18 and the complemental grooves 9' are in high compression. It is this duplex of my vertical joints which is of considerable importance in preserving the tightness of the joints.

Having thus described my improved pre-fabricated or knock-down tank, what I claim is:

A knock-down tank comprising vertical tank wall sections each fitted on its opposite vertical edges with hook-shaped plates for hooking two adjacent edges together to form a lock joint, said hook-shaped plates of each joint being complementally formed to pass into hooking and unhooking engagement by lateral swinging movement of one of the sections relative to the other as well as by vertically sliding them into engagement, said hook-shaped plates formed of separate strips of metal secured respectively to the edges of the sections and each strip formed with a thicker portion overlying the extreme edge of the tank wall section and formed with a step to receive the edge of the section, and said thicker portions meeting for portion of their thickness in edgewise abutting engagement with one another substantially in the plane of the tank wall and one of the edgewise abutting portions formed with a projecting aligning lip seating in a depression in the other abutting portion.

STEPHEN W. ZOLDOK.